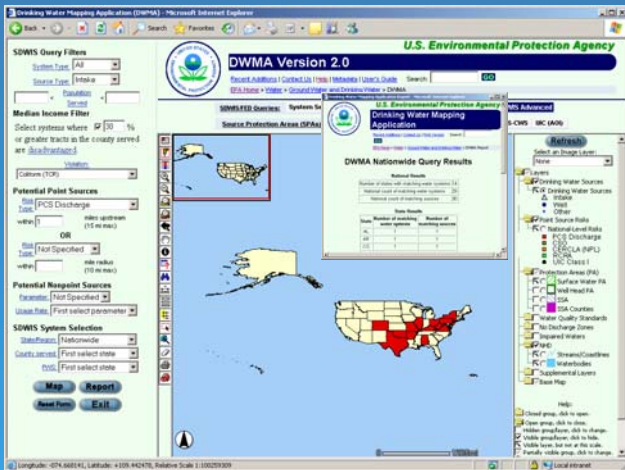# Drinking Water Mapping Application:
Using GIS to Protect Drinking Water

Overview
*The U.S. Environmental Protection Agency's Office of Ground Water and Drinking Water (OGWDW)
is applying state-of-the-art, web-based mapping and database technology to enhance Agency
capabilities to identify major contaminant risks to public drinking water supplies.*

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Using GIS to Protect Drinking Water

The Drinking Water Mapping Application (DWMA) provides key EPA technical staff and managers with a readily accessible tool to run queries and reports , and generate maps vital to the efficient management of drinking water programs under the Safe Drinking Water Act (SDWA). This GIS tool is available to designated EPA staff and managers at the national and regional level for the identification of contaminant risks to surface and ground water, and to better protect and safeguard public drinking water sources. The DWMA focuses on public water supplies, source water protection and underground injection control (UIC). This secure application applies state-of-the-art, Web-based mapping and database technology to enhance Agency capabilities to identify major contaminant risks to drinking water sources for both surface water and ground water. The DWMA is part of EPA's WATERS (Watershed Assessment, Tracking & Environmental Results) architecture. For surface water, the DWMA uses the USGS National Hydrography Dataset (NHD) to create an analysis framework, leveraging the existing EPA database infrastructure by connecting directly to the Reach Address Database (RAD), and a repository of NHD and non-NHD water quality data submitted by states to EPA. This includes information from the Safe Drinking Water Information System (SDWIS/FED), state Source Water Protection programs, major national databases (PCS, RCRAInfo, CERCLIS) and other sources (USGS and USDA). Furthermore, the DWMA provides a hydrogeologic framework for classifying groundwater environments using information from national GIS coverages.

Combined with "drill down" tools, map tools, and query, analytical and reporting functions, the DWMA can generate either maps or reports at varying scales of analysis. A basic concept in the DWMA is to provide geospatial analysis functions around and within the delineated source water protection areas, and risk analyses using buffer zones around source water intakes and wellheads. The DWMA combines multiple query functions in one GIS application that integrates data affecting drinking water protection and allows spatial queries across multiple data sources, including integration with water quality standards, impaired waters and many different risk factors. All of the functions are useful in determining the relationships for program integration and effectiveness measures.
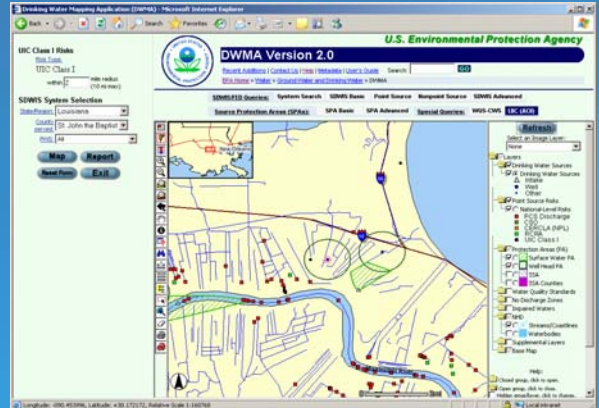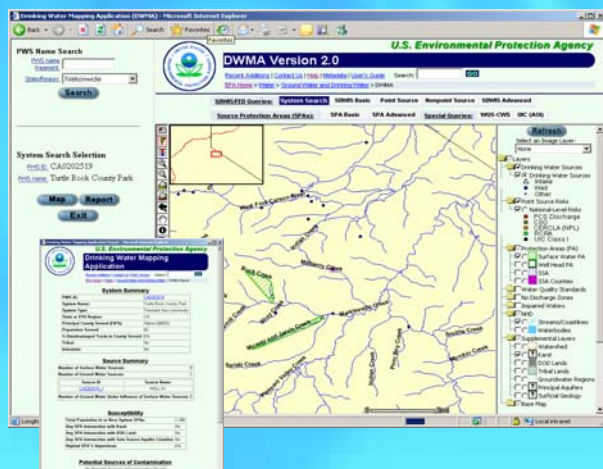
The Drinking Water Mapping Application (DWMA):

• Is a secure system with a focused target audience

• Combines data querying and mapping

• Incorporates surface water and ground water data

• Provides a national framework for source water protection analysis

• Uses surface water information (e.g., intakes) georeferenced to the National Hydrography Dataset (NHD)

• Uses non-NHD shapes (wells, wellheads, injection wells, waste sites, etc.)

• Performs upstream/downstream and proximity analyses

• Uses analytical Source Protection Area (SPA) polygons to process both vector data (e.g., PCS discharge points) and raster data (e.g., percent impervious cover indicators based on the National Land Cover Dataset)

• Allows users to filter layers based on database attributes

• Enables spatial queries across multiple data sources

• Provides tabular reports, geological cross-sections, and maps